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(54) **WAFER CASSETTE AND PLACEMENT METHOD THEREOF**

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(Continued)

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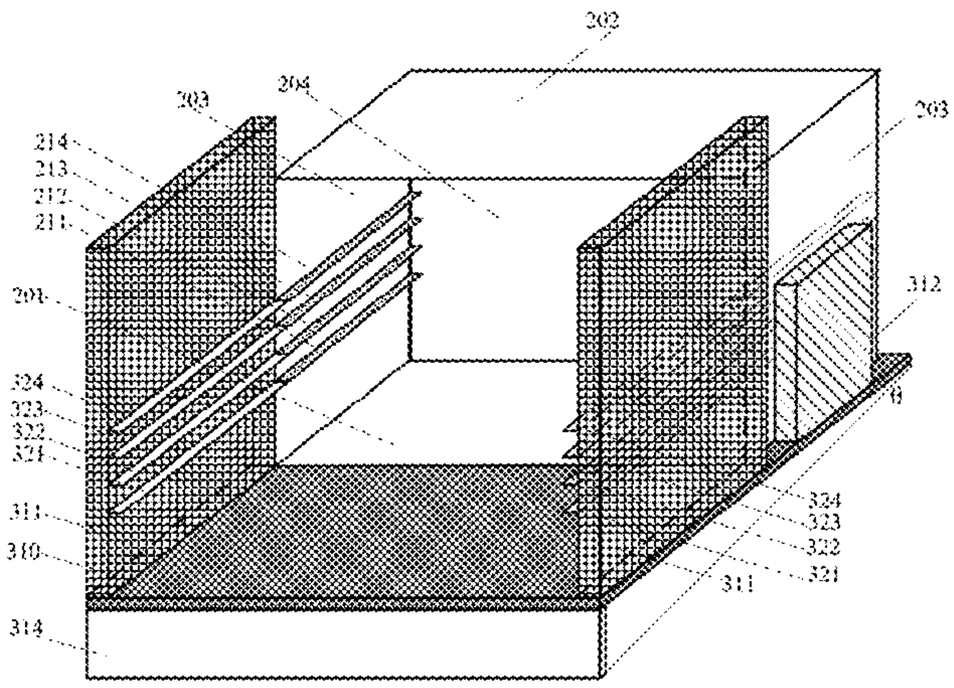
(57) **ABSTRACT**

A wafer cassette and a method for placing a wafer are provided. The wafer cassette includes a box body including a plurality of groups of card slots formed on sidewalls of the box body. Each group of the card slots is configured to hold a wafer and includes a wafer input terminal. The wafer cassette also includes a guide device including a plurality of groups of guide slots configured to be docked to the wafer input terminals. Each group of the guide slots and a docking group of the card slots are formed at a same floor.

20 Claims, 3 Drawing Sheets



(52) **U.S. Cl.**
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(58) **Field of Classification Search**
USPC 206/710, 711; 414/404
See application file for complete search history.

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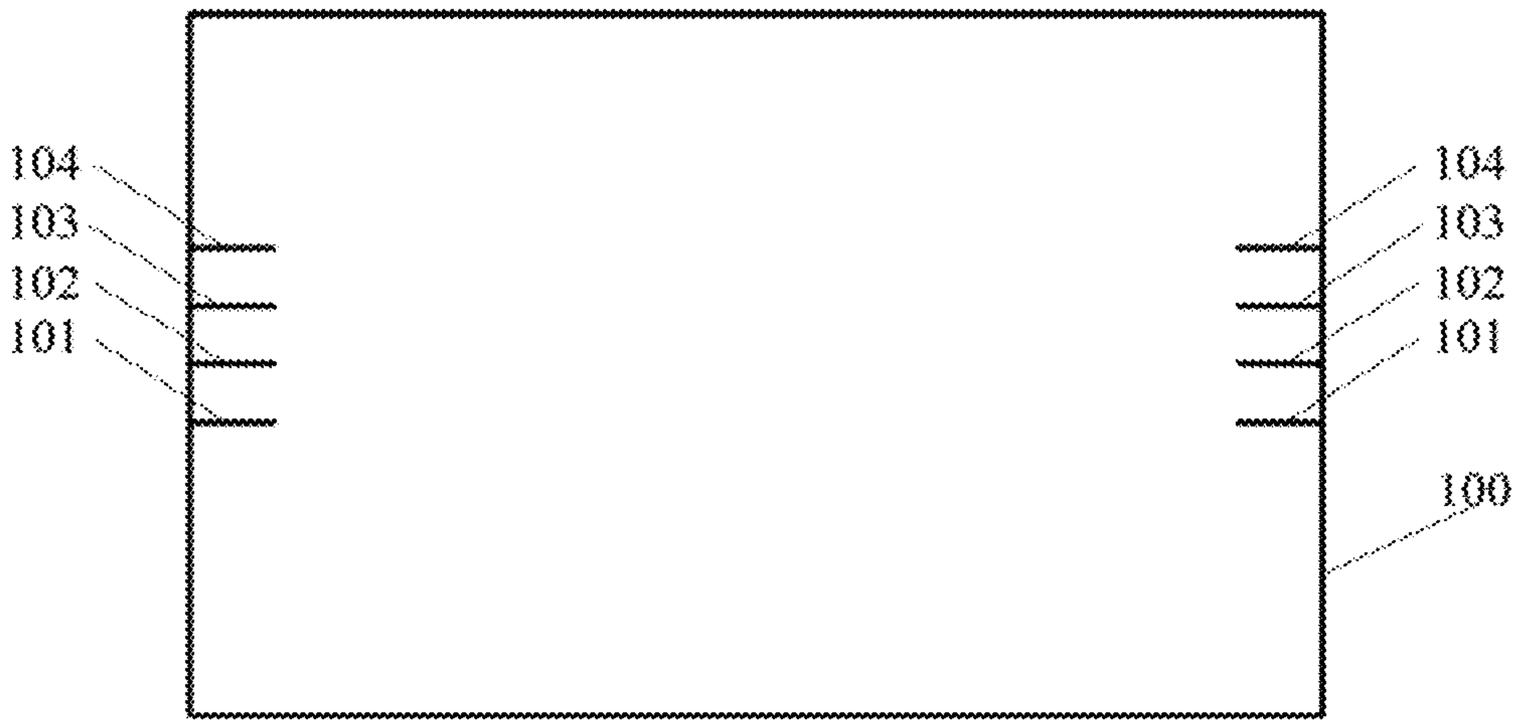


Figure 1 (Prior Art)

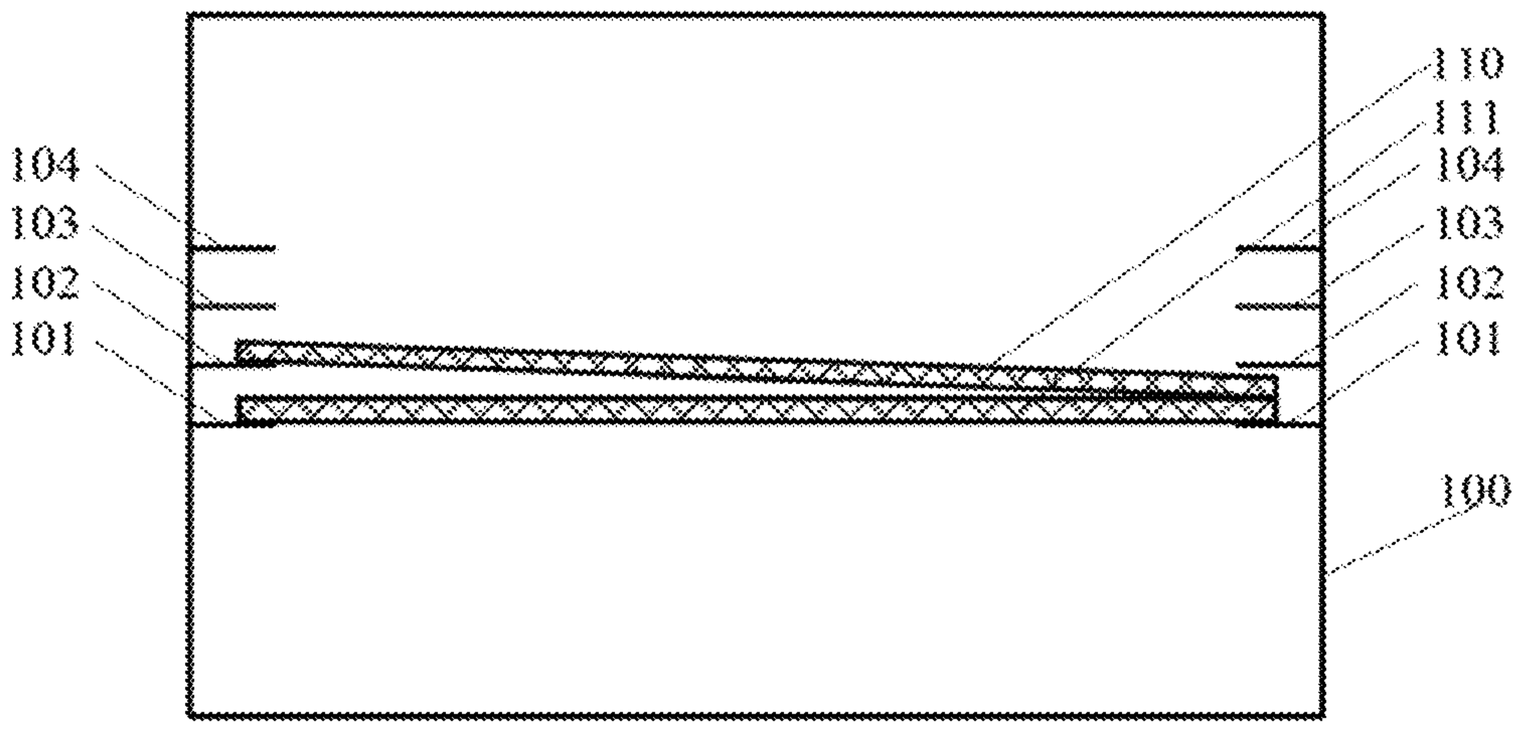


Figure 2 (Prior Art)

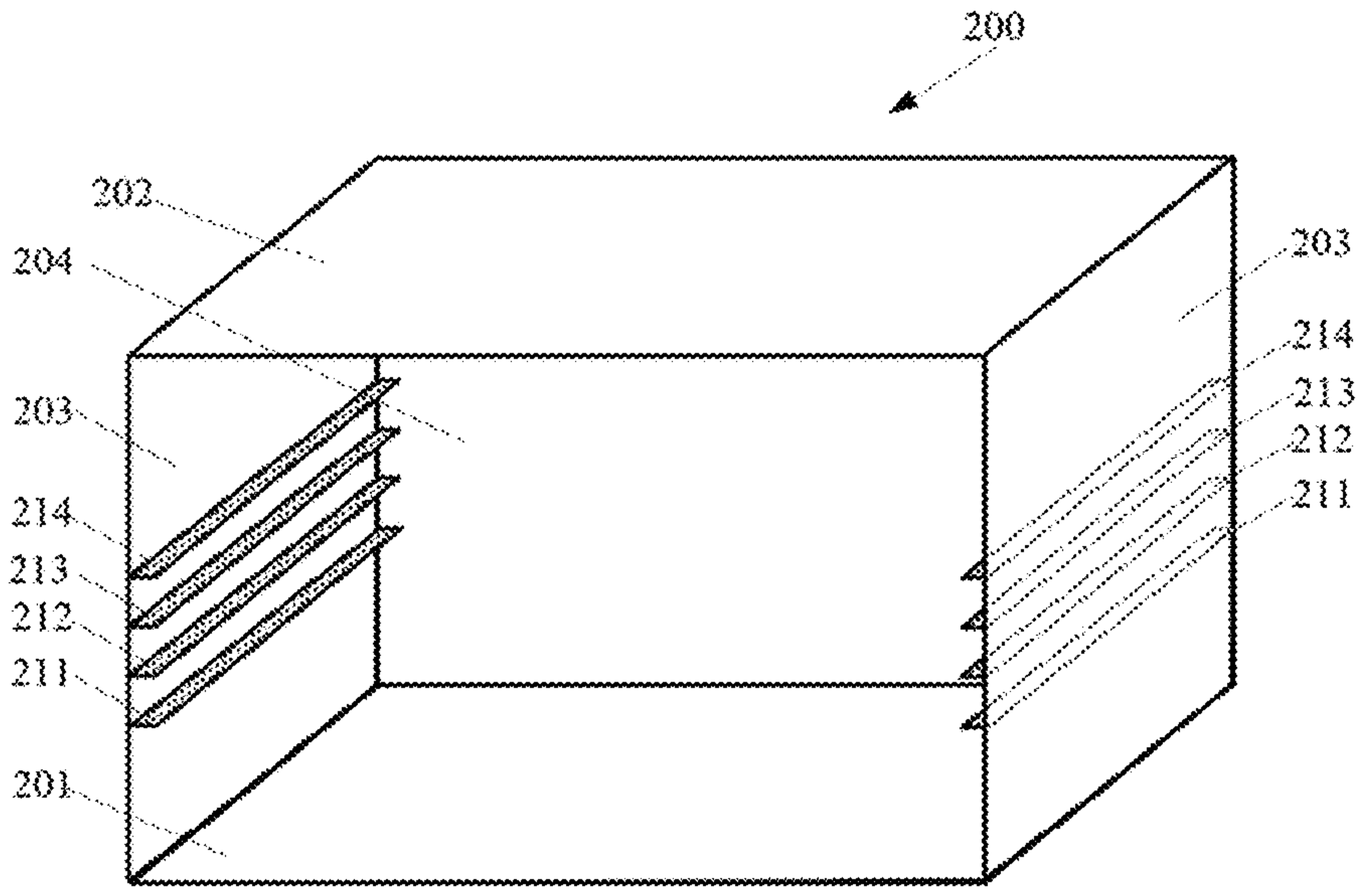


Figure 3

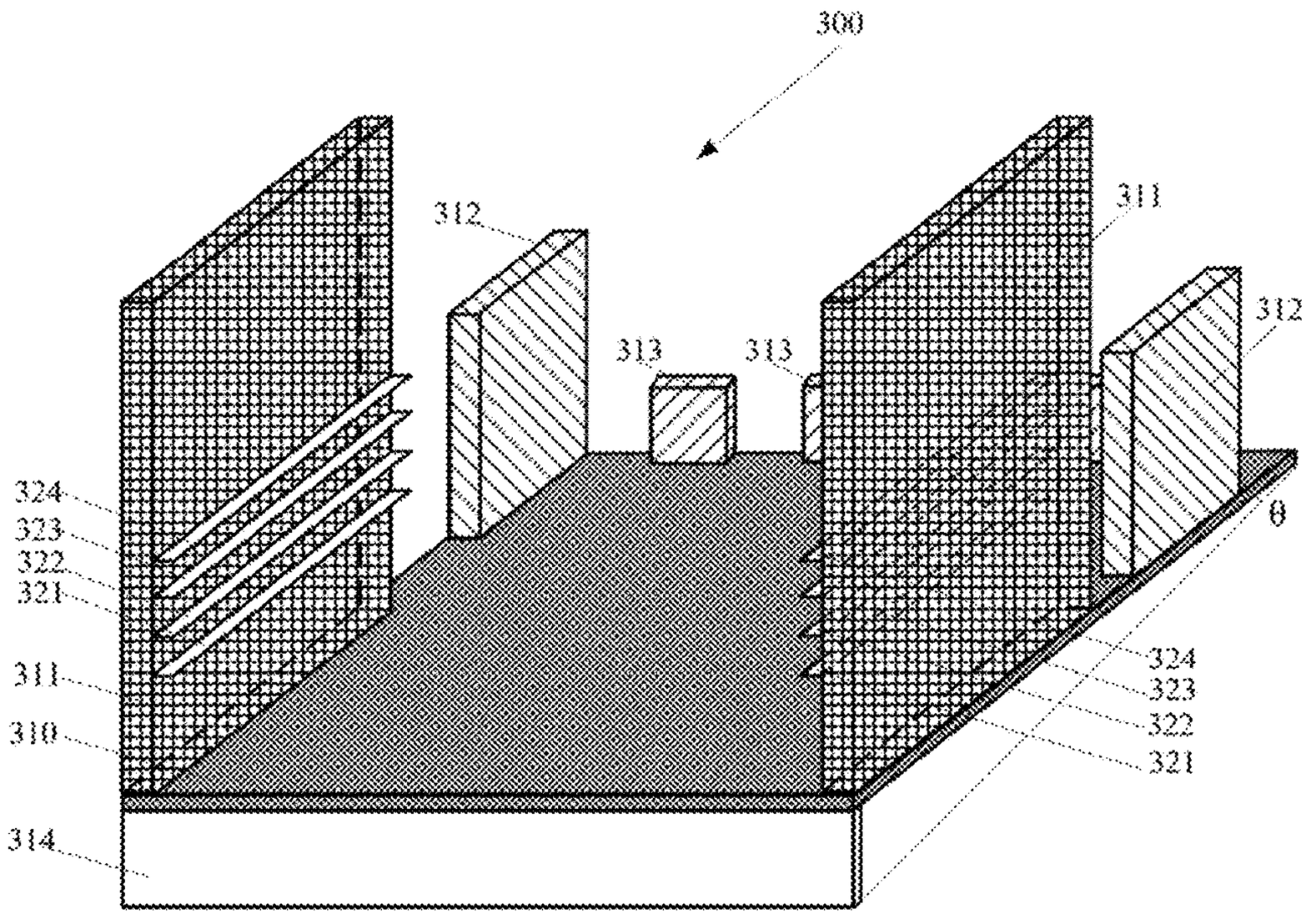
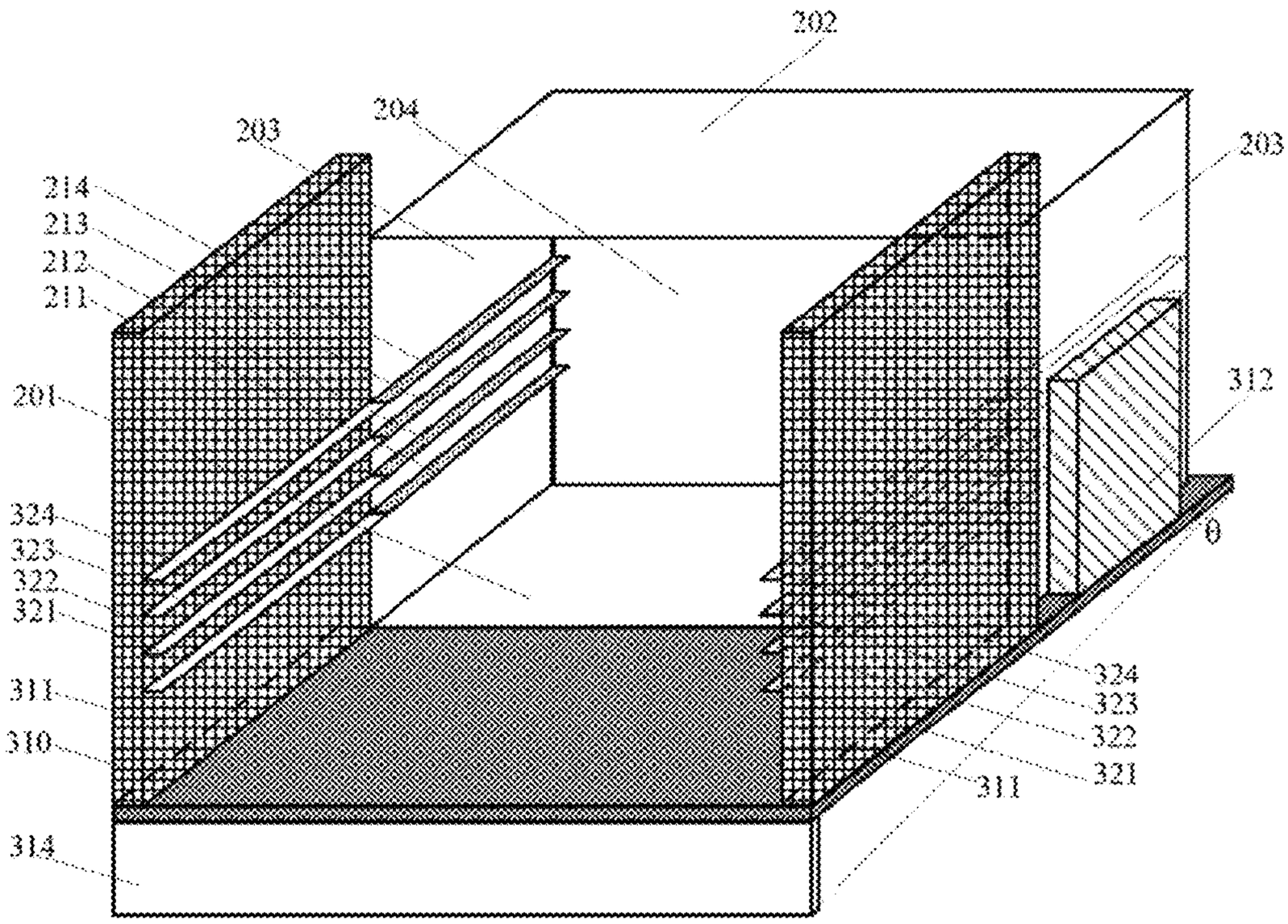


Figure 4


202
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203
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312
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311

Figure 5

WAFER CASSETTE AND PLACEMENT METHOD THEREOF

CROSS-REFERENCES TO RELATED APPLICATIONS

This application claims the priority of Chinese patent application No. 201610239031.1, filed on Apr. 18, 2016, the entirety of which is incorporated herein by reference.

FIELD OF THE INVENTION

The present invention generally relates to the field of semiconductor equipment technology and, more particularly, relates to a wafer cassette and placement method thereof.

BACKGROUND

During a semiconductor fabrication process, a wafer needs to be transferred between different manufacturing processes, as well as between different regions of the same manufacturing process. A wafer cassette is often used in both the transportation and storage processes. The wafer cassette can provide a clean environment for holding the wafer, and avoid contaminations on the wafer from contamination sources in the manufacturing environment which may have a lower cleanliness level compared to the wafer cassette.

To improve utilization of the wafer cassette, a plurality of wafers are usually stored in one wafer cassette. The wafer cassette has a plurality of card slots. The card slots can divide and support the wafers, thus the bottom of the wafer is suspended and the wafers are placed in an orderly manner in the wafer cassette. When the equipment the manufacturing process fails or needs maintenance, the wafers need to be placed in the wafer cassette by a manual operation.

However, when manually placing the wafers in an existing wafer cassette, the wafers are easily scratched. The disclosed device structures and methods are directed to solve one or more problems set forth above and other problems.

BRIEF SUMMARY OF THE DISCLOSURE

One aspect of the present disclosure includes a wafer cassette. The wafer cassette includes a box body including a plurality of groups of card slots formed on sidewalls of the box body. Each group of the card slots is configured to hold a wafer and includes a wafer input terminal. The wafer cassette also includes a guide device including a plurality of groups of guide slots configured to be docked to the wafer input terminals. Each group of the guide slots and a docking group of the card slots are formed at a same floor.

Another aspect of the present disclosure includes a method of placing wafers. The method includes providing a plurality of wafers. The method also includes placing a wafer on a group of guide slots. In addition, the method includes sliding the wafer onto a corresponding group of card slots through the group of the guide slots. Further, the method includes repeating the steps of placing another wafer on the guide slots and sliding the another wafer onto the corresponding card slots until all of the plurality of wafers are placed on the card slots.

Other aspects of the present disclosure can be understood by those skilled in the art in light of the description, the claims, and the drawings of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates an existing wafer cassette;

FIG. **2** illustrates a schematic diagram of an abnormal placement of a wafer in an existing wafer cassette; and

FIGS. **3-5** illustrate structures corresponding to certain stages to form an exemplary wafer cassette consistent with various disclosed embodiments of the present disclosure.

DETAILED DESCRIPTION

Reference will now be made in detail to exemplary embodiments of the invention, which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or the alike parts.

Referring to FIG. **1**, in one embodiment, a wafer cassette includes a box body **100**, and a plurality of groups of card slots formed on both sidewalls of the box body **100**. The card slots in each group are configured facing toward each other and formed at the same floor. Each group of the card slots is configured to hold and/or secure a wafer.

Referring to FIG. **1**, the number of groups of the card slots is four as an example. Specifically, the card slots include a first group of the card slots **101**, a second group of the card slots **102** formed above the first group of the card slots **101**, a third group of the card slots **103** formed above the second group of the card slots **102**, and a fourth group of the card slots **104** formed above the third group of the card slots **103**.

When the equipment in the manufacturing process fails or needs maintenance, the wafers need to be placed in the wafer cassette by a manual operation. The wafers may be easily scratched when manually placing the wafers in the wafer cassette. Reasons for the described issue include the following.

On the one hand, the distance between the card slots in adjacent floors is too small, generally in a range of approximately 5 mm-10 mm. Therefore, it is easy to place the wafer on the card slots in different floors and mutually staggered, and to place the adjacent wafers on the card slots at the same floor in one side. FIG. **2** illustrates a schematic diagram of an abnormal placement of the wafer in the existing wafer cassette. Referring to FIG. **2**, a wafer **111** is placed on the first group of the card slots **101**. One side of a wafer **110** is placed on one side of the second group of the card slots **102**, and another side of the wafer **110** is placed on one side of the first group of the card slots **101**. Therefore, the wafer **110** can rub and collide with the wafer **111**, easily causing the wafers to scratch each other.

On the other hand, even if the wafer is placed on the card slots at the same floor and without misalignment, a large angle between the wafer and an extension direction of the card slots placing the wafer easily occurs when manually sliding the wafer onto the card slots. Therefore, the adjacent wafers can contact and scratch each other.

The present disclosure provides a wafer cassette. FIGS. **3-5** illustrate structures corresponding to certain stages to form an exemplary wafer cassette consistent various disclosed embodiments of the present disclosure.

Referring to FIG. **3**, an exemplary wafer cassette may include a box body **200**, and a plurality of groups of card slots formed on both sidewalls of the box body **200**. The card slots may be configured to hold a wafer to be placed. The card slots may include a wafer input terminal.

Although FIG. **3** shows four groups of the card slots formed on the sidewalls of the box body **200**, any number, e.g., less than or more than four, of groups of the card slots may be formed on the sidewalls of the box body **200**. The card slots may include a first group of the card slots **211**, a second group of the card slots **212** formed above the first

group of the card slots **211**, a third group of the card slots **213** formed above the second group of the card slots **212**, and a fourth group of the card slots **214** formed above the third group of the card slots **213**. In certain embodiments, the number of groups of the card slots may be selected based on the specific situation.

In various embodiments, card slots in any one group may be paired, grouped, or otherwise configured for placing a wafer thereon. For example, the card slots in each group may be formed at a same level, or sometimes same floor, suitable for holding a wafer. In one embodiment, the card slots in the first group **211** may be formed at the same floor, the card slots in the second group **212** may be formed at the same floor, the card slots in the third group **213** may be formed at the same floor, and the card slots in the fourth group **214** may be formed at the same floor.

In one embodiment, the number of the card slots in each group may be two as an example, while in other embodiments, the number of the card slots in each group may be three, four, or any other suitable numbers. When the number of the card slots in each group is two, the card slots in each soup may be configured facing toward each other.

In one embodiment, the distance between the card slots in adjacent floors may be in a range of approximately 5 mm-10 mm. The box body **200** and the card slots may be made of a metal, such as stainless steel.

The card slots may be configured to hold and/or secure the wafer to be placed in place. Each group of the card slots may be configured to place one piece of the wafer. One piece of the wafer may be placed on one group of the card slots in the same floor. For example, one piece of the wafer may be placed on the first group of the card slots **211**, the second group of the card slots **212**, the third group of the card slots **213**, or the fourth group of the card slots **214**.

The card slots may include the wafer input terminal. The wafer input terminal may be configured as a starting terminal where the wafer slides onto the card slots. Specifically, each group of the card slots may include a corresponding wafer input terminal. In one embodiment, the first group of the card slots **211** may include a first wafer input terminal, the second group of the card slots **212** may include a second wafer input terminal, the third group of the card slots **213** may include a third wafer input terminal, and the fourth group of the card slots **214** may include a fourth wafer input terminal.

The box body **200** may include a box bottom layer **201**, a box top layer **202** configured facing toward the box bottom layer **201**, and a box sidewall formed between and in contact with the box bottom layer **201** and the box top layer **202**. The box bottom layer **201**, the box top layer **202**, and the box sidewall may form a semi-closed box body. Thus, the box body **200** may include a window. The window may be formed between the box bottom layer **201** and the box top layer **202**.

In one embodiment, the shape of the box body **200** may be, for example, a square body, although the box body **200** may have any suitable shape. The square body may be a cube or a cuboid. The box sidewall may include a first box sidewall **203** and a second box sidewall **204**. The first box sidewall **203** may be formed at both sides of the second box sidewall **204** and perpendicular to the second box sidewall **204**. The first box sidewall **203** may be formed at side of the window, and the second box sidewall **204** may be configured facing toward the window.

The card slots may be formed on the box sidewall. In one embodiment, the number of the card slots in each group may be two. All the first group of the card slots **211**, the second group of the card slots **212**, the third group of the card slots **213**, and the fourth group of the card slots **214** may be formed on the first box sidewall **203**. In certain embodiments, all the first group of the card slots **211**, the second group of the card slots **212**, the third group of the card slots **213**, and the fourth group of the card slots **214** may be formed on the first box sidewall and the second box sidewall.

Referring to FIG. **4**, the wafer cassette may also include a guide device **300**. The guide device **300** may include a plurality of groups of guide slots. The guide slots may be configured to be docked to the wafer input terminal. Each group of the guide slots and a docking group of the card slots may be formed at the same floor. The number of groups of the guide slots may be equal to the number of groups of the card slots.

Although FIG. **4** shows four groups of the guide slots, any number, e.g., less than or more than four, of groups of the guide slots may be formed. Specifically, the guide slots may include a first group of the guide slots **321**, a second group of the guide slots **322** formed above the first group of the guide slots **321**, a third group of the guide slots **323** formed above the second group of the guide slots **322**, and a fourth group of the guide slots **324** formed above the third group of the guide slots **323**. In certain embodiments, the number of groups of the guide slots may be selected based on the specific requirement.

In various embodiments, guide slots in any one group may be paired, grouped, or otherwise configured for placing a wafer thereon. For example, the guide slots in each group may be formed at a same level, or sometimes same floor, suitable for holding a wafer. In one embodiment, the guide slots in the first group **321** may be formed at the same floor, the guide slots in the second group **322** may be formed at the same floor, the guide slots in the third group **323** may be formed at the same floor, and the guide slots in the fourth group **324** may be formed at the same floor.

The distance between the guide slots in adjacent floors may be the same as the distance between the card slots in adjacent floors. In one embodiment, the number of the guide slots in each group may be two as an example, while in other embodiments, the number of the guide slots in each group may be three, four, or any other suitable numbers. When the number of the guide slots in each group is two, the guide slots in each group may be configured facing toward each other.

The guide slots may be configured to be docked to the wafer input terminals of the card slots. In one embodiment, the first group of the guide slots **321** may be docked to the first wafer input terminal, the second group of the guide slots **322** may be docked to the second wafer input terminal, the third group of the guide slots **323** may be docked to the third wafer input terminal, and the fourth group of the guide slots **324** may be docked to the fourth wafer input terminal.

Each group of the guide slots and the docking group of the card slots may be formed at the same floor. In one embodiment, the first group of the card slots **211** and the first group of the guide slots **321** may be formed at the same floor, the second group of the card slots **212** and the second group of the guide slots **322** may be formed at the same floor, the third group of the card slots **213** and the third group of the guide slots **323** may be formed at the same floor, and the fourth group of the card slots **214** and the fourth group of the guide slots **324** may be formed at the same floor.

In one embodiment, when the number of the guide slots in each group is two, the guide slots in each group may be configured facing toward each other. At this time, the guide

slots may be configured to be docked to the wafer input terminal along a longitudinal direction of the card slots. In one embodiment, the first group of the guide slots **321** may be docked to the wafer input terminal of the first group of the card slots **211** along the longitudinal direction of the first group of the card slots **211**. The second group of the guide slots **322** may be docked to the wafer input terminal of the second group of the card slots **212** along the longitudinal direction of the second group of the card slots **212**. The third group of the guide slots **323** may be docked to the wafer input terminal of the third group of the card slots **213** along the longitudinal direction of the third group of the card slots **213**. The fourth group of the guide slots **324** may be docked to the wafer input terminal of the fourth group of the card slots **214** along the longitudinal direction of the fourth group of the card slots **214**.

When the guide slots is configured to be docked to the wafer input terminal along the longitudinal direction of the card slots, the length of the guide slots may need to be selected in a suitable range with respect to the length of the card slots. If the length of the guide slots is too long with respect to the length of the card slots, it may waste materials. If the length of the guide slots is too small with respect to the length of the card slots, it may cause the support area provided to the wafer before sliding the wafer onto the card slots to be too small, thus the wafer cannot be effectively supported by the guide slots. In one embodiment, the length of the guide slots may be approximately 0.5-4.5 times of the length of the card slots.

The guide slots may include front-guide and back-guide terminals configured on opposite sides. The back-guide terminal may be configured to be docked to the wafer input terminal. The front-guide terminal may be affixed with a label. The labels affixed to the front-guide terminals in the same group of the guide slots may be the same, and the labels affixed to the front-guide terminals in different groups of the guide slots may be different. The label may be marked with an identification symbol. The identification symbol may be a number, a letter, a geometric figure, or other symbols that can be used for identification.

In one embodiment, the guide device **300** may also include a bottom plate **310** configured to accommodate the box body **200** (shown in FIG. **3**). Specifically, the upper surface of the bottom plate **310** may be configured in contact with the box bottom layer **201**.

In addition, the guide device **300** may include a first guide plate **311** formed on the bottom plate **310**. The first guide plate **311** may be configured to be docked to the box sidewall at the side of the window. In one embodiment, the first guide plate **311** may be configured to be docked to the first box sidewall **203**. The guide slots may be formed on the inner sidewall of the first guide plate **311**.

Moreover, the guide device **300** may include a side plate formed on the bottom plate **310** and configured to hold and/or secure the box body **200**. The inner sidewall of the side plate may be configured in contact with the box sidewall.

The side plate may include a first side plate **312**. The first side plate **312** may be formed on the bottom plate **310**. The inner sidewall of the first side plate **312** may be configured in contact with the first box sidewall **203**. The size of the first side plate **312** in a direction perpendicular to the bottom plate **310** may be smaller than the size of the box sidewall in the direction perpendicular to the bottom plate **310**. Therefore, the frictional force between the first side plate **312** and the box sidewall may be small when subsequently placing the box body **200** on the bottom plate **310**. Specifically, the size of the first side plate **312** in the direction perpendicular to the bottom plate **310** may be in a range of approximately 80 mm-120 mm, including 80 mm, 100 mm, or 120 mm, etc.

The side plate may also include a second side plate **313**. The second side plate **313** may be formed on the bottom plate **310**. The inner sidewall of the second side plate **313** may be configured in contact with the second box sidewall **204**. The size of the second side plate **313** in the direction perpendicular to the bottom plate **310** may be smaller than the size of the box sidewall in the direction perpendicular to the bottom plate **310**. Therefore, the frictional force between the second side plate **313** and the box sidewall may be small when subsequently placing the box body **200** on the bottom plate **310**. Further, the size of the second side plate **313** in the direction perpendicular to the bottom plate **310** may be smaller than the size of the first side plate **312** in the direction perpendicular to the bottom plate **310**, to further facilitate subsequently placing the box body **200** on the bottom plate **310**. Specifically, the size of the second side plate **313** in the direction perpendicular to the bottom plate **310** may be in a range of approximately 15 mm-25 mm, including 15 mm, 20 mm, or 25 mm, etc.

Further, the guide device **300** may include a support plate **314**. The support plate **314** may be formed under the bottom plate **310**. The support plate **314** may be configured to set the bottom plate **310** in one side toward the window higher than the bottom plate **310** in the other side back to the window after accommodating the box body **200** by the bottom plate **310**.

The bottom plate **310** may include leading edge and trailing edge configured on opposite sides. The window may be configured facing toward the leading edge after accommodating the box body **200** by the bottom plate **110**. The support plate **314** may be firmed under the bottom plate **310** and in contact with the leading edge of the bottom plate **310**. The support plate **314** may be perpendicular to the bottom plate **310**. Or an angle formed between the support plate **314** and the bottom plate **310** may be an acute angle or an obtuse angle.

Referring to FIG. **4**, the support plate **314** may tilt the bottom plate **310**. An inclination angle θ may be formed between the bottom plate **310** and the horizontal plane. The inclination angle θ of the bottom plate **310** may need to be selected in a suitable range. When manually placing the wafer in the wafer cassette, a suitable viewing angle may be provided to accurately place the wafer on one group of the guide slots at the same floor. Therefore, the inclination angle θ of the bottom plate **310** may be in a range of approximately 25 degrees-35 degrees, including 25 degrees, 30 degrees, or 35 degrees, etc.

Because the bottom plate **300** may be tilted by the support plate **314**, the front-guide terminal of the guide slots may be higher than the back guide terminal of the guide slots, to facilitate recognizing the position of the guide slots and placing the wafer on the guide slots. After subsequently placing the box body **200** on the bottom plate **310** of the guide device **300**, the window of the box body **200** may be tilted backward and the wafer may be slid onto the inclined card slots through the inclined guide slots, to facilitate placing the wafer on the card slots.

The bottom plate **310**, the first guide plate **311**, the first side plate **312**, the second side plate **313** and the guide slots may be made of a metal, such as stainless steel.

The guide device **300** and the box body **200** may need to be assembled together for operation. Referring to FIG. **5**, the box body **200** may be placed on the bottom plate **310**. After

assembling the guide device **300** and the box body **200**, the guide slots may be docked to the wafer input terminals of the card slots. Each group of the guide slots and the docking group of the card slots may be formed at the same floor.

Specifically, in one embodiment, the first group of the guide slots **321** may be docked to the first wafer input terminal, the second group of the guide slots **322** may be docked to the second wafer input terminal, the third group of the guide slots **323** may be docked to the third wafer input terminal, and the fourth group of the guide slots **324** may be docked to the fourth wafer input terminal. The first group of the card slots **211** and the first group of the guide slots **321** may be formed at the same floor, the second group of the card slots **212** and the second group of the guide slots **322** may be formed at the same floor, the third group of the card slots **213** and the third group of the guide slots **323** may be formed at the same floor, and the fourth group of the card slots **214** and the fourth group of the guide slots **324** may be formed at the same floor.

After assembling the guide device **300** and the box body **200**, the first guide plate **311** may be docked to the first box sidewall **203**, and the inner sidewall of the side plate may be configured in contact with the box sidewall to hold and/or secure the box body **200** on the bottom plate **310**. In one embodiment, the inner sidewall of the first side plate **312** may be configured in contact with the first box sidewall **203**, and the inner sidewall of the second side plate **313** may be configured in contact with the second box sidewall **204**.

Because the guide device includes a plurality of groups of the guide slots, the guide slots are configured to be docked to the wafer input terminals, and each group of the guide slots and the docking group of the card slots are formed at the same floor, the wafer can be slid onto the card slots through the guide slots. Because the wafer can be slid onto the card slots through the guide slots, on the one hand, when the wafer is correctly placed on the guide slots, the wafer can be held parallel to the card slots before being slid onto the card slots. Therefore, the occurrence of a large angle between the wafer and the card slots placing the wafer may be avoided when manually placing the wafer in the wafer cassette, preventing the wafer on the card slots at one floor from scratching against the wafer on the card slots at the adjacent floor. On the other hand, when the wafer is placed on the guide slots at different floors and mutually staggered, because the wafer on the guide slots cannot touch the wafers already placed on the card slots, an opportunity may be provided to replace the wafer, avoiding the wafers to scratch each other.

Correspondingly, a method of placing wafers is also provided. The method may include: providing a plurality of wafers; placing a wafer on a group of the guide slots; sliding the wafer onto a corresponding group of the card slots through the group of the guide slots; and repeating the steps of placing another wafer on the guide slots and sliding the another wafer onto the corresponding card slots until all of the plurality of wafers are placed on the card slots.

In the method of placing wafer consistent with the disclosed embodiments, each wafer may be slid onto a corresponding group of the card slots through a group of the guide slots, thus the wafer can be held parallel to the card slots before being slid onto the card slots. Therefore, the occurrence of the large angle between the wafer and the card slots placing the wafer may be avoided when manually placing the wafer in the wafer cassette, preventing the wafer on the card slots at one floor from scratching against the wafer on the card slots at the adjacent floor.

The above detailed descriptions only illustrate certain exemplary embodiments of the present invention, and are not intended to limit the scope of the present in invention. Those skilled in the art can understand tree specification as whole and technical features in the various embodiments can be combined into other embodiments understandable to those persons of ordinary skill in the art. Any equivalent or modification thereof, without departing from the spirit and principle of the present invention, falls within the true scope of the present invention.

What is claimed is:

1. A wafer cassette, comprising:

a box body including a plurality of groups of card slots formed on sidewalls of the box body, wherein each group of the card slots is configured to hold a wafer and includes a wafer input terminal; and

a guide device including a plurality of groups of guide slots configured to be docked to the wafer input terminals, wherein each group of the guide slots and a docking group of the card slots are formed at a same height, wherein:

the guide device includes a bottom plate,

the guide device includes first guide plates and side plates, wherein:

the side plates include first side plates and second side plates on top of the bottom plate,

a height of the first guide plates is bigger than a height of the first side plates, and

a height of the first side plates is bigger than a height of the second side plates, and

the guide device includes a support plate formed under the bottom plate and in contact with a leading edge of the bottom plate.

2. The wafer cassette according to claim **1**, wherein:

the card slots in each group are formed at the same height; and

the guide slots in each group are formed at the same height.

3. The wafer cassette according to claim **2**, wherein:

the number of the card slots in each group is two;

the card slots in each group are configured facing toward each other;

the number of the guide slots in each group is two; and

the guide slots in each group are configured facing toward each other.

4. The wafer cassette according to claim **3**, wherein:

the guide slots are configured to be docked to the wafer input terminals along a longitudinal direction of the card slots.

5. The wafer cassette according to claim **4**, wherein:

a length of the guide slots is approximately 0.5-1.5 times of a length of the card slots.

6. The wafer cassette according to claim **1**, wherein:

a distance between the guide slots in adjacent heights is the same as a distance between the card slots in adjacent heights.

7. The wafer cassette according to claim **1**, wherein:

the number of groups of the guide slots is equal to the number of groups of the card slots.

8. The wafer cassette according to claim **1**, wherein:

the guide slots include front-guide and back-guide terminals configured on opposite sides; and

the back-guide terminal is configured to be docked to the wafer input terminal.

9. The wafer cassette according to claim **1**, wherein:

the box body includes a semi-closed box body and a window;

the semi-closed box body is formed by a box bottom layer, a box top layer configured facing toward the box bottom layer, and the box sidewalls formed between and in contact with the box bottom layer and the box top layer; and

the window is formed between the box bottom layer and the box top layer.

10. The wafer cassette according to claim **9**, wherein:

the bottom plate configured to accommodate the box body, wherein an upper surface of the bottom plate is configured in contact with the box bottom layer.

11. The wafer cassette according to claim **10**, wherein:

the first guide plates are formed on the bottom plate and configured to be docked to the box sidewalls at a side of the window, wherein the guide slots are formed on inner sidewalls of the first guide plates.

12. The wafer cassette according to claim **10**, wherein:

the side plates are formed on the bottom plate and configured to hold the box body, wherein inner sidewalls of the side plates are configured in contact with the box sidewalls.

13. The wafer cassette according to claim **12**, wherein:

the box body is a square body;

the box sidewalls of the box body include first box sidewalls and a second box sidewall, wherein the first box sidewalls are formed at both sides of the second box sidewall and perpendicular to the second box sidewall;

the first box sidewall is configured at a side of the window; and

the second box sidewall is configured facing toward the window.

14. The wafer cassette according to claim **13**, wherein:

the first side plates are formed on the bottom plate, wherein inner sidewalls of the first side plates are configured in contact with the first box sidewalls.

15. The wafer cassette according to claim **14**, wherein:

the second side plates are formed on the bottom plate, wherein inner sidewalls of the second side plates are configured in contact with the second box sidewall.

16. The wafer cassette according to claim **10**, wherein:

the support plate is configured to set the bottom plate in one side toward the window higher than the bottom plate in the other side configured facing toward the window after accommodating the box body by the bottom plate.

17. The wafer cassette according to claim **16**, wherein:

the bottom plate includes the leading edge and a trailing edge configured on opposite sides; and

the window is configured facing toward the leading edge.

18. The wafer cassette according to claim **17**, wherein:

an angle between the bottom plate and a horizontal plane is in a range of approximately 25 degrees-35 degrees.

19. A method of placing wafers, comprising:

providing a plurality of wafers;

providing a wafer cassette, the wafer cassette including:

a box body, including a plurality of groups of card slots formed on sidewalls of the box body, wherein each group of the card slots is configured to hold a wafer and includes a wafer input terminal;

a guide device, including a plurality of groups of guide slots configured to be docked to the wafer input terminals, wherein each group of the guide slots and a docking group of the card slots are formed at a same height, wherein:

the guide device includes a bottom plate,

the guide device includes first guide plates and side plates, wherein:

the side plates include first side plates and second side plates on top of the bottom plate,

a height of the first guide plates is bigger than a height of the first side plates, and

a height of the first side plates is bigger than a height of the second side plates, and

the guide device includes a support plate formed under the bottom plate and in contact with a leading edge of the bottom plate;

sliding the one of the plurality of wafers onto a corresponding one of the plurality of groups of card slots through the one of the plurality of groups of guide slots by tilting the guide device; and

repeating the steps of placing another one of the plurality of wafers on another one of the plurality of groups of guide slots and sliding the another one of the plurality of wafers onto a next corresponding another one of the plurality of groups of card slots until all of the plurality of wafers are placed on the plurality of card slots.

20. The method of placing wafers according to claim **19**, wherein:

the guide device is tilted by an angle in a range of approximately 25 degrees-35 degrees.

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